

**Remarks/Arguments**

First, applicant appreciates the lifting of the earlier section 103 and 112 rejections.

As a useful preface to the principal remarks concerning the current section 103 rejection, applicant will now comment on the previous Office Action and response, because it shows why the current obviousness rejection, which is based principally on the Gsell et al. reference, should be withdrawn -- and the application finally allowed.

In the Office Action of October 9, 2002, preceding the current Action, claims were rejected under section 103(a) based on the Stoyell et al. patent in view of Marshall et al. In its many examples, Stoyell et al. had various disclosures of filter media in annular pleated filter cartridges, including a PTFE material ("G") which the Examiner (as pointed out on page 7 of the response) erroneously deemed as "made of polyethylene," and a polypropylene *non-woven* material ("C") which, as pointed out by applicant on page 7 of the response, was very thick and thus *importantly different* from applicant's inventive annular pleated filter cartridge.

In such response/amendment to the October 9, 2002 Office Action, independent claims 1 and 23 were amended to specify the *extreme thinness* of the required Tyvek non-woven material -- thus distinguishing over the *non-woven* material of the Stoyell et al. patent. In the argument, applicant noted that the non-woven material of Stoyell et al. "is some *14 times as thick* as the 0.15 mm specified as the thickest material falling within the range specified in applicant's amended claim 1." Applicant's response to such earlier Office Action then continued as follows:

Thus, the Stoyell et al. patent is fully consistent with the prior art as presented and discussed during prosecution of the instant patent application. Note, for example, Dr. Mayer's declaration (particularly at paragraphs 12 and 13) which

refers to non-woven materials in prior annular pleated filter cartridges as "substantially thicker" than the TYVEK non-woven filter media of the claimed annular pleated filter cartridge -- while also describing why the use of the TYVEK non-woven filter media in an annular pleated filter cartridge would not have been obvious to the person of ordinary skill in the art. Thus, applicant has already laid out in convincing detail how applicant's claimed invention is patentably distinct over the prior art, and specifically how it is unobvious to use the admitted TYVEK material in the claimed annular pleated filter cartridge. Claim 1 and its dependent claims, as well as claim 23 and its dependent claims, are patentably distinct over the prior art.

Based on such earlier amendment and response, the Examiner appropriately lifted the rejection of applicant's claims based on Stoyell et al. in view of Marshall et al. Now, for precisely the same reasons, the rejections of applicant's amended claims based on Gsell et al. in view of Marshall et al. should be lifted. Applicant's presently-pending claims should be allowed. Nonobviousness has been thoroughly shown and supported.

Turning now specifically to the present Office Action, claims 1-4, 6-7, 9-13, 22-23 and 29-31 were rejected under 35 USC 103(a) as unpatentable over Gsell et al. in view of Marshall et al. As noted above, applicant respectfully disagrees for reasons detailed below. These claims as previously amended (through amendment of independent claims 1 and 23) are patentably distinguishable over this prior art.

The Gsell et al. reference, as with the earlier-cited Stoyell et al. reference, discloses a non-woven filter material in an annular pleated filter cartridge. The Gsell material is a *not* Tyvek, nor for that matter is it even polyethylene; instead, it is polyethylene terephthalate (PET) or polybutylene terephthalate (PBT). However, what is important to note is that the non-woven material of the Gsell et al. patent has a thickness of 0.25 cm to 7.62 cm (see column 7, lines 20-21). (This

thickness was noted by the Examiner.) Thus, even the very thinnest non-woven material contemplated in the Gsell et al. (0.25 cm -- i.e., 2.5 mm) is *nearly 17 times thicker* than the very thickest Tyvek material of applicant's claimed invention -- which requires Tyvek material "having a thickness of less than about 0.15 mm."

In other words, the Gsell et al. patent, like Stoyell et al. patent, is fully consistent with the prior art as presented and discussed in the instant patent application and during prosecution. Thick non-woven materials are seen in annular pleated filter cartridges, but Tyvek is so very flimsy and different in nature that the person of ordinary skill in the art related to annular pleated filter cartridges would not have considered it a candidate for filter medium in this special class of products.

Dr. Ernest Mayer, the long-standing DuPont expert whose declaration of November 28, 2001 is of record in connection with this patent application,<sup>1</sup> offered the following factual evidence on this matter in his declaration:

12. Annular pleated non-woven filter cartridges are known to utilize *non-woven* filter materials, such as of polypropylene, nylon and various polyesters, that are significantly thicker and bulkier than the Tyvek material used in the unique annular pleated filter cartridges of the Rose et al. patent application. Until creation of the present invention there were no annular pleated liquid filtration cartridges utilizing Tyvek as the filtration medium.

13. Pleated annular filter cartridges of the type having non-wovens for filtration have particular problems and concerns relating to a difficulty of reliably achieving appropriate sealing of the pleated ends of a pleated non-woven with cartridge endcaps, as is absolutely essential in order to avoid by-pass of the filter. Based on my experience in the art, those skilled in the art of annular pleated non-

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<sup>1</sup>Filed with the response to the first Office Action.

woven filter cartridges would typically believe that the Tyvek non-woven material referred to in the Rose et al. patent application would not reliably achieve the end sealing relationship that is essential for annular pleated filter cartridges, and would thus turn to other thicker, bulkier non-woven materials. The Tyvek material is highly flexible, and to persons of ordinary skill in the art such thin flexible Tyvek material would not be considered appropriate for annular pleated filter cartridges.

14. The Tyvek material of the annular pleated filter cartridge of the Rose et al. patent application is very thin -- preferably less than about 0.15 mm thick and most preferably less than or equal to about 0.13 mm thick. Given such thinness and the nature of such material, the use of such fragile material for an annular pleated filter cartridge would be contra-indicated to a person of ordinary skill in the art because such material would not be thought reliably capable of successful lengthwise bonding (Tyvek-to-Tyvek) as necessary for formation of an annular pleated filter cartridge for liquid filter use.

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16. Nor would persons of ordinary skill in the art, who are aware of the nature of the problems typically associated with manufacture of annular pleated non-woven filter cartridges and made aware of characteristics of the Tyvek material, regard such Tyvek material as a material reasonably usable in connection with creation of an annular pleated non-woven filter cartridge.

17. More specifically, given the low firmness (high flexibility) of such filter material, and the material thinness which exacerbates such flexibility, the ability for such material to be formed successfully into an annular pleated filter cartridge was not and would not have been apparent to persons of ordinary skill in the art.

Given this important evidence and the dramatic differences in the claimed invention over the disclosure of the Gsell et al. patents, the rejection of claims 1-4, 6-7, 9-13, 22-23 and 29-31 based on Gsell et al. in view of Marshall et al. should be withdrawn. These claims represent an important advance in the art, which is of great value.

If for any reasons the Examiner believes that the ample evidence from Dr. Mayer as to the state of the art would better be provided in a declaration that specifically refers to the principal

reference (Gsell et al.), such a document is available. However, the undersigned notes and understands that the pertinent declaration paragraphs quoted above are in context; i.e., they deal with *non-woven* materials as filter media in annular pleated filter cartridges.

Claims 18-21 were rejected under 35 USC 103(a) as unpatentable over Gsell et al. and Marshall et al. in further view of Pall (US 4,033,881) and Hawley's Condensed Chemical Dictionary. This rejection is respectfully traversed in view of the foregoing comments with respect to claim 1 on which claims 18-21 are directly or indirectly dependent. Claims 18-21 are patentably distinct over the prior art.

Claims 14-15, 17, 24-25 and 27 were rejected under 35 USC 103(a) as unpatentable over Gsell et al. and Marshall et al. in further view of the article Ethylene Polymers, LDPE, Ethylene Polymers, HDPE, and Miller et al. This rejection is respectfully traversed in view of the foregoing comments with respect to claims 1 and 23 on which these rejected claims are directly or indirectly dependent. Such claims are patentably distinct over the prior art.

In summary, the rejection of the presently outstanding Office Action is overcome by the previously amended claims and by the evidence of the state of the art relating to annular pleated filter cartridges. The claimed invention is a very significant advance in the art and provides advantages not previously available. Furthermore, as amply demonstrated by facts, including facts concerning the state of the art from Dr. Ernest Mayer, the claimed invention was not obvious -- indeed, quite the opposite.

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Response dated September 8, 2003  
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Applicant believes that all claims are patentably distinct over the prior art. Therefore, Applicant believes that all rejections have been fully dealt with and that all claims are in proper form for allowance. Early favorable action is earnestly solicited. The Examiner is invited to call the undersigned attorney if that would be helpful in facilitating resolution of any issues which might remain.

Respectfully submitted,



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